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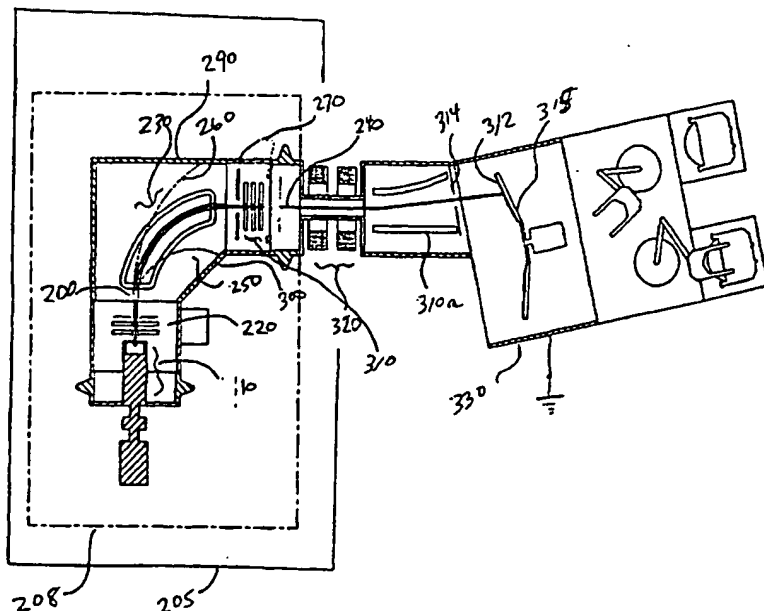
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(54) Title: AN ION IMPLANTATION DEVICE AND A METHOD OF SEMICONDUCTOR MANUFACTURING BY THE IM-
PLANTATION OF BORON HYDRIDE CLUSTER IONS



(57) Abstract: An ion implantation device and a method of manufacturing a semiconductor device is described, wherein ionized boron hydride molecular clusters are implanted to form P-type transistor structures. For example, in the fabrication of Complementary Metal-Oxide Semiconductor (CMOS) devices, the clusters are implanted to provide P-type doping for Source and Drain structures and for Polygates; these doping steps are critical to the formation of PMOS transistors. The molecular cluster ions have the chemical form $B_nH_x^+$ and $B_nH_x^-$, where 10